LIST OF CONTENTS

Volume 66, Number 1

January 2002

Volume 66, Number 1 January 2002

Articles

Y. TAKAHASHI, T. KIMURA, and Y. MINAI: Direct observation of Cm(III)-fulvate species on fulvic acid-montmorillonite hybrid by laser-induced fluorescence spectroscopy 1

A. D. JACOBSON, J. D. BLUM, C. P. CHAMBERLAIN, M. A. POAGE, and V. F. SLOAN: Ca/Sr and Sr isotope systematics of a Himalayan glacial chronosequence: Carbonate versus silicate weathering rates as a function of landscape surface age 13

T. K. DALAI, S. K. SINGH, J. R. TRIVEDI, and S. KRISHNASWAMI: Dissolved rhenium in the Yamuna River System and the Ganga in the Himalaya: Role of black shale weathering on the budgets of Re, Os, and U in rivers and CO_2 in the atmosphere 29

S. J. FALLON, J. C. WHITE, and M. T. MCCULLOCH: *Porites* corals as recorders of mining and environmental impacts: Misima Island, Papua New Guinea 45

G.-T. ZHOU and Y.-F. ZHENG: Kinetic mechanism of oxygen isotope disequilibrium in precipitated witherite and aragonite at low temperatures: An experimental study 63

V. LIEBETRAU, A. EISENHAUER, N. GUSSONE, G. WÖRNER, B. T. HANSEN, and T. LEIPE: $226Ra_{excess}$/Ba growth rates and U-Th-Ra-Ba systematic of Baltic Mn/Fe crusts 73

A. SCHIPPERS and B. B. JØRGENSEN: Biogeochemistry of pyrite and iron sulfide oxidation in marine sediments 85

J. R. BECKETT: Role of basicity and tetrahedral speciation in controlling the thermodynamic properties of silicate liquids, part 1: The system $CaO\text{-}MgO\text{-}Al_2O_3\text{-}SiO_2$ 93

K. ROSELIEB and A. JAMBON: Tracer diffusion of Mg, Ca, Sr, and Ba in Na-aluminosilicate melts 105

J. E. MUNGALL: Empirical models relating viscosity and tracer diffusion in magmatic silicate melts 125

L. GROSSMAN, D. S. EBEL, and S. B. SIMON: Formation of refractory inclusions by evaporation of condensate precursors 145

F. KITAJIMA, T. NAKAMURA, N. TAKAOKA, and T. MURAE: Evaluating the thermal metamorphism of CM chondrites by using the pyrolytic behavior of carbonaceous macromolecular matter 163

C. M. O'D. ALEXANDER, S. TAYLOR, J. S. DELANEY, P. MA, and G. F. HERZOG: Mass-dependent fractionation of Mg, Si, and Fe isotopes in five stony cosmic spherules 173

January (Vol. 66, No. 2)

Volume 66, Number 2 January 2002

Articles

C. M. PINA and A. PUTNIS: The kinetics of nucleation of solid solutions from aqueous solutions: A new model for calculating non-equilibrium distribution coefficients 185

J. M. ZACHARA, S. C. SMITH, C. LIU, J. P. MCKINLEY, R. J. SERNE, and P. L. GASSMAN: Sorption of Cs^+ to micaceous subsurface sediments from the Hanford site, USA 193

S. A. WELCH and J. F. BANFIELD: Modification of olivine surface morphology and reactivity by microbial activity during chemical weathering 213

S. HUON, F. E. GROUSSET, D. BURDLOFF, G. BARDOUX, and A. MARIOTTI: Sources of fine-sized organic matter in North Atlantic Heinrich Layers: $\delta^{13}C$ and $\delta^{15}N$ tracers 223

K. C. FANTON, C. HOLMDEN, G. S. NOWLAN, and F. M. HAIDL: $^{143}Nd/^{144}Nd$ and Sm/Nd stratigraphy of Upper Ordovician epeiric sea carbonates 241

G. M. HENDERSON and E. MAIER-REIMER: Advection and removal of ^{210}Pb and stable Pb isotopes in the oceans: A general circulation model study 257

J. W. MORGAN, R. J. WALKER, M. F. HORAN, E. S. BEARY, and A. J. NALDRETT: ^{190}Pt–^{186}Os and ^{187}Re–^{187}Os systematics of the Sudbury Igneous Complex, Ontario 273

J. V. OGLESBY, P. ZHAO, and J. F. STEBBINS: Oxygen sites in hydrous aluminosilicate glasses: The role of Al-O-Al and H_2O 291

S. K. LEE and J. F. STEBBINS: Extent of intermixing among framework units in silicate glasses and melts 303

A. FOWLER, A. PROKOPH, R. STERN, and C. DUPUIS: Organization of oscillatory zoning in zircon: Analysis, scaling, geochemistry, and model of a zircon from Kipawa, Quebec, Canada 311

R. J. WALKER, H. M. PRICHARD, A. ISHIWATARI, and M. PIMENTEL: The osmium isotopic composition of convecting upper mantle deduced from ophiolite chromites 329

J. A. WHITBY, J. D. GILMOUR, G. TURNER, M. PRINZ, and R. D. ASH: Iodine–Xenon dating of chondrules from the Qingzhen and Kota Kota enstatite chondrites 347

February (Vol. 66, No. 3)

Volume 66, Number 3 February 2002

Articles

A. C. LASAGA and H. OHMOTO: The oxygen geochemical cycle: Dynamics and stability 361

A. M. WIDLER and T. M. SEWARD: The adsorption of gold(I) hydrosulphide complexes by iron sulphide surfaces 383

J. HAMILTON-TAYLOR, A. S. POSTILL, E. TIPPING, and M. P. HARPER: Laboratory measurements and modeling of metal–humic interactions under estuarine conditions 403

I. L'HEUREUX and B. JAMTVEIT: A model of oscillatory zoning in solid solutions grown from aqueous solutions: Applications to the $(Ba,Sr)SO_4$ system 417

C. COCOZZA, C. C. G. TSAO, S.-F. CHEAH, S. M. KRAEMER, K. N. RAYMOND, T. M. MIANO, and G. SPOSITO: Temperature dependence of goethite dissolution promoted by trihydroxamate siderophores 431

D. RICKERT, M. SCHLÜTER, and K. WALLMANN: Dissolution kinetics of biogenic silica from the water column to the sediments 439

B. A. S. VAN MOOY, R. G. KEIL, and A. H. DEVOL: Impact of suboxia on sinking particulate organic carbon: Enhanced carbon flux and preferential degradation of amino acids via denitrification 457

R. FREI, M. T. ROSING, T. E. WAIGHT, and D. G. ULFBECK: Hydrothermal-metasomatic and tectono-metamorphic processes in the Isua supracrustal belt (West Greenland): A multi-isotopic investigation of their effects on the Earth's oldest oceanic crustal sequence 467

K. R. LUDWIG and J. B. PACES: Uranium-series dating of pedogenic silicas and carbonate, Crater Flat, Nevada 487

E. M. CHAMORRO, R. A. BROOKER, J.-A. WARTHO, B. J. WOOD, S. P. KELLEY, and J. D. BLUNDY: Ar and K partitioning between clinopyroxene and silicate melt to 8 GPa 507

F. M. RICHTER, A. M. DAVIS, D. S. EBEL, and A. HASHIMOTO: Elemental and isotopic fractionation of Type B calcium-, aluminum-rich inclusions: Experiments, theoretical considerations, and constraints on their thermal evolution 521

Book Reviews

M. A. IVANOVA: *Catalogue of Meteorites,* 5th ed., revised and enlarged, by M. M. Grady 541

C. KOEBERL: *Discovering the Solar System,* by B. W. Jones 543

February (Vol. 66, No. 4)

Volume 66, Number 4 February 2002

Awards Ceremony Speeches

I. I. KAPLAN: Citation for presentation of 2001 Alfred E. Treibs Award to John W. Smith May 22, 2001 545

J. W. SMITH: Acceptance Speech for the 2001 Alfred E. Treibs Award 547

E. TAKAHASHI: Citation for presentation of the 2001 Victor M. Goldschmidt Award to Ikuo Kushiro 549

I. KUSHIRO: Acceptance of the 2001 V. M. Goldschmidt Award 551

D. K. NEWMAN: Citation for presentation of the 2001 Patterson Award to François M. M. Morel 553

F. M. M. MOREL: Acceptance of the 2001 Clair C. Patterson Award 555

R. J. KIRKPATRICK: Citation for presentation of the 2001 F. W. Clarke Award to Craig C. Lundstrom 557

C. C. LUNDSTROM: Acceptance of the 2001 F. W. Clarke Award 559

Articles

B. MÉNEZ, P. PHILIPPOT, M. BONNIN-MOSBAH, A. SIMIONOVICI, and F. GIBERT: Analysis of individual fluid inclusions using Synchrotron X-Ray Fluorescence microprobe: progress toward calibration for trace elements 561

A. P. LEE, B. L. PHILLIPS, and W. H. CASEY: The kinetics of oxygen exchange between the $GeO_4Al_{12}(OH)_{24}(OH_2)_{12}^{8+}$(aq) molecule and aqueous solutions 577

S. DAS SHARMA, D. J. PATIL, and K. GOPALAN: Temperature dependence of oxygen isotope fractionation of CO_2 from magnesite-phosphoric acid reaction 589

M. SHARP, R. A. CREASER, and M. SKIDMORE: Strontium isotope composition of runoff from a glaciated carbonate terrain 595

L.-H. CHAN, A. STARINSKY, and A. KATZ: The behavior of lithium and its isotopes in oilfield brines: Evidence from the Heletz–Kokhav field, Israel 615

Y.-F. ZHENG, Z.-R. WANG, S.-G. LI, and Z.-F. ZHAO: Oxygen isotope equilibrium between eclogite minerals and its constraints on mineral Sm-Nd chronometer 625

Y. LIANG and A. M. DAVIS: Energetics of multicomponent diffusion in molten CaO-Al_2O_3-SiO_2 635

A. J. CAMPBELL, M. HUMAYUN, and M. K. WEISBERG: Siderophile element constraints on the formation of metal in the metal-rich chondrites Bencubbin, Weatherford, and Gujba 647

R. A. MENDYBAEV, J. R. BECKETT, L. GROSSMAN, E. STOLPER, R. F. COOPER, and J. P. BRADLEY: Volatilization kinetics of silicon carbide in reducing gases: An experimental study with applications to the survival of presolar grains in the solar nebula 661

E. D. YOUNG, R. D. ASH, A. GALY, and N. S. BELSHAW: Mg isotope heterogeneity in the Allende meteorite measured by UV laser ablation–MC–ICPMS and comparisons with O isotopes 683

A. E. RUBIN: Smyer H-chondrite impact-melt breccia and evidence for sulfur vaporization 699

S. TACHIBANA, A. TSUCHIYAMA, and H. NAGAHARA: Experimental study of incongruent evaporation kinetics of enstatite in vacuum and in hydrogen gas 713

Comment and Response

V. J. TERWILLIGER: Comment on "A mechanistic model for interpretation of hydrogen and oxygen isotope ratios in tree-ring cellulose," by J. S. Roden, G. Lin, and J. R. Ehleringer (2000) *Geochim. Cosmochim. Acta* **64,** 21–35 729

J. S. RODEN, G. LIN, and J. R. EHLERINGER: Response to the comment of V. J. Terwilliger on "A mechanistic model for interpretation of hydrogen and oxygen isotope ratios in tree-ring cellulose," by J. S. Roden, G. Lin, and J. R. Ehleringer (2000) *Geochim. Cosmochim. Acta* **64,** 21–35 733

March (Vol. 66, No. 5)

Volume 66, Number 5 March 2002

Presidential Address

M. F. HOCHELLA, JR.: There's plenty of room at the bottom: Nanoscience in geochemistry 735

Articles

A. GUNNARS, S. BLOMQVIST, P. JOHANSSON, and C. ANDERSSON: Formation of Fe(III) oxyhydroxide colloids in freshwater and brackish seawater, with incorporation of phosphate and calcium 745

A. PAONITA, R. FAVARA, P. M. NUCCIO, and F. SORTINO: Genesis of fumarolic emissions as inferred by isotope mass balances: CO_2 and water at Vulcano Island, Italy 759

J. ZHANG, L. W. LION, Y. M. NELSON, M. L. SHULER, and W. C. GHIORSE: Kinetics of Mn(II) oxidation by *Leptothrix discophora* SS1 773

M. PRIETO, Á. FERNÁNDEZ-GONZÁLEZ, and R. MARTÍN-DÍAZ: Sorption of chromate ions diffusing through barite-hydrogel composites: Implications for the fate and transport of chromium in the environment 783

W. AESCHBACH-HERTIG, M. STUTE, J. F. CLARK, R. F. REUTER, and P. SCHLOSSER: A paleotemperature record derived from dissolved noble gases in groundwater of the Aquia Aquifer (Maryland, USA) 797

M. E. HODSON: Experimental evidence for mobility of Zr and other trace elements in soils 819

M. MULLET, S. BOURSIQUOT, M. ABDELMOULA, J.-M. GÉNIN, and J.-J. EHRHARDT: Surface chemistry and structural properties of mackinawite prepared by reaction of sulfide ions with metallic iron 829

Y. HARLAVAN and Y. EREL: The release of Pb and REE from granitoids by the dissolution of accessory phases 837

D. PAILLER, E. BARD, F. ROSTEK, Y. ZHENG, R. MORTLOCK, and A. VAN GEEN: Burial of redox-sensitive metals and organic matter in the equatorial Indian Ocean linked to precession 849

T. NEUMANN, U. HEISER, M. A. LEOSSON, and M. KERSTEN: Early diagenetic processes during Mn-carbonate formation: Evidence from the isotopic composition of authigenic Ca-rhodochrosites of the Baltic Sea 867

I. N. TOLSTIKHIN, I. L. KAMENSKY, B. MARTY, V. A. NIVIN, V. R. VETRIN, E. G. BALAGANSKAYA, S. V. IKORSKY, M. A. GANNIBAL, D. WEISS, A. VERHULST, and D. DEMAIFFE: Rare gas isotopes and parent trace elements in ultrabasic-alkaline-carbonatite complexes, Kola Peninsula: Identification of lower mantle plume component 881

G. PRATESI, C. VITI, C. CIPRIANI, and M. MELLINI: Silicate-silicate liquid immiscibility and graphite ribbons in Libyan Desert Glass 903

March (Vol. 66, No. 6)

Volume 66, Number 6 March 2002

Articles

S. A. CARROLL, R. S. MAXWELL, W. BOURCIER, S. MARTIN, and S. HULSEY: Evaluation of silica-water surface chemistry using NMR spectroscopy 913

H. M. STOLL, Y. ROSENTHAL, and P. FALKOWSKI: Climate proxies from Sr/Ca of coccolith calcite: Calibrations from continuous culture of *Emiliania huxleyi* 927

T. R. FILLEY, K. H. FREEMAN, R. T. WILKIN, and P. G. HATCHER: Biogeochemical controls on reaction of sedimentary organic matter and aqueous sulfides in holocene sediments of Mud Lake, Florida 937

D. J. REPETA, T. M. QUAN, L. I. ALUWIHARE, and A. ACCARDI: Chemical characterization of high molecular weight dissolved organic matter in fresh and marine waters 955

C. FEDERICO, A. AIUPPA, P. ALLARD, S. BELLOMO, P. JEAN-BAPTISTE, F. PARELLO, and M. VALENZA: Magma-derived gas influx and water-rock interactions in the volcanic aquifer of Mt. Vesuvius, Italy 963

A. CHIDTHAISONG, K.-J. CHIN, D. L. VALENTINE, and S. C. TYLER: A comparison of isotope fractionation of carbon and hydrogen from paddy field rice roots and soil bacterial enrichments during CO_2/H_2 methanogenesis 983

S. BOSZE and J. RAKOVAN: Surface-structure-controlled sectoral zoning of the rare earth elements in fluorite from Long Lake, New York, and Bingham, New Mexico, USA 997

J. THOMSON, F. M. DYER, and I. W. CROUDACE: Records of radionuclide deposition in two salt marshes in the United Kingdom with contrasting redox and accumulation conditions 1011

C. A. MASIELLO, E. R. M. DRUFFEL, and L. A. CURRIE: Radiocarbon measurements of black carbon in aerosols and ocean sediments 1025

N. J. PEARSON, O. ALARD, W. L. GRIFFIN, S. E. JACKSON, and S. Y. O'REILLY: In situ measurement of Re-Os isotopes in mantle sulfides by laser ablation multicollector–inductively coupled plasma mass spectrometry: Analytical methods and preliminary results .. 1037

B. J. A. WILLIGERS, J. A. BAKER, E. J. KROGSTAD, and D. W. PEATE: Precise and accurate in situ Pb-Pb dating of apatite, monazite, and sphene by laser ablation multiple-collector ICP-MS 1051

E. F. BAXTER, D. J. DEPAOLO, and P. R. RENNE: Spatially correlated anomalous $^{40}Ar/^{39}Ar$ "age" variations in biotites about a lithologic contact near Simplon Pass, Switzerland: A mechanistic explanation for excess Ar 1067

T. YOKOYAMA and E. NAKAMURA: Precise determination of ferrous iron in silicate rocks 1085

E. D. YOUNG, A. GALY, and H. NAGAHARA: Kinetic and equilibrium mass-dependent isotope fractionation laws in nature and their geochemical and cosmochemical significance 1095

April (Vol. 66, No. 7)

Volume 66, Number 7 April 2002

Articles

C. H. LAMBORG, W. F. FITZGERALD, J. O'DONNELL, and T. TORGERSEN: A non–steady-state compartmental model of global-scale mercury biogeochemistry with interhemispheric atmospheric gradients 1105

G. A. WAYCHUNAS, C. C. FULLER, and J. A. DAVIS: Surface complexation and precipitate geometry for aqueous Zn(II) sorption on ferrihydrite I: X-ray absorption extended fine structure spectroscopy analysis 1119

T. J. NAMEROFF, L. S. BALISTRIERI, and J. W. MURRAY: Suboxic trace metal geochemistry in the eastern tropical North Pacific 1139

R. E. ZEEBE and A. SANYAL: Comparison of two potential strategies of planktonic foraminifera for house building: Mg^{2+} or H^+ removal? 1159

C. P. SLOMP, J. THOMSON, and G. J. DE LANGE: Enhanced regeneration of phosphorus during formation of the most recent eastern Mediterranean sapropel (S1) 1171

T. MONECKE, U. KEMPE, J. MONECKE, M. SALA, and D. WOLF: Tetrad effect in rare earth element distribution patterns: A method of quantification with application to rock and mineral samples from granite-related rare metal deposits 1185

O. DEQUINCEY, F. CHABAUX, N. CLAUER, O. SIGMARSSON, N. LIEWIG, and J.-C. LEPRUN: Chemical mobilizations in laterites: Evidence from trace elements and ^{238}U-^{234}U-^{230}Th disequilibria 1197

P. K. VAN DE WATER: The effect of chemical processing on the $\delta^{13}C$ value of plant tissue 1211

J. GLODNY, B. BINGEN, H. AUSTRHEIM, J. F. MOLINA, and A. Rusin: Precise eclogitization ages deduced from Rb/Sr mineral systematics: The Maksyutov complex, Southern Urals, Russia 1221

O. M. LOVERA, M. GROVE, and T. MARK HARRISON: Systematic analysis of K-feldspar $^{40}Ar/^{39}Ar$ step heating results II: Relevance of laboratory argon diffusion properties to nature 1237

Y. UENO, H. YURIMOTO, H. YOSHIOKA, T. KOMIYA, and S. MARUYAMA: Ion microprobe analysis of graphite from ca. 3.8 Ga metasediments, Isua supracrustal belt, West Greenland: Relationship between metamorphism and carbon isotopic composition 1257

O. B. JAMES, C. FLOSS, and J. J. MCGEE: Rare earth element variations resulting from inversion of pigeonite and subsolidus reequilibration in lunar ferroan anorthosites 1269

J. M. EILER, J. W. VALLEY, C. M. GRAHAM, and J. FOURNELLE: Two populations of carbonate in ALH84001: Geochemical evidence for discrimination and genesis 1285

April (Vol. 66, No. 8)

Volume 66, Number 8 April 2002

Articles

H. M. Steele, K. Wright, and I. H. Hillier: Modelling the adsorption of uranyl on the surface of goethite 1305

A. P. Rübel, C. Sonntag, J. Lippmann, F. J. Pearson, and A. Gautschi: Solute transport in formations of very low permeability: Profiles of stable isotope and dissolved noble gas contents of pore water in the Opalinus Clay, Mont Terri, Switzerland 1311

E. H. de Carlo and W. J. Green: Rare earth elements in the water column of Lake Vanda, McMurdo Dry Valleys, Antarctica 1323

P. A. Maurice, D. M. McKnight, L. Leff, J. E. Fulghum, and M. Gooseff: Direct observations of aluminosilicate weathering in the hyporheic zone of an Antarctic Dry Valley stream 1335

D. T. Vaniman, S. J. Chipera, D. L. Bish, M. C. Duff, and D. B. Hunter: Crystal chemistry of clay-Mn oxide associations in soils, fractures, and matrix of the Bandelier Tuff, Pajarito Mesa, New Mexico 1349

A. Bollhöfer and K. J. R. Rosman: The temporal stability in lead isotopic signatures at selected sites in the Southern and Northern Hemispheres 1375

M. G. Siemann and M. Schramm: Henry's and non-Henry's law behavior of Br in simple marine systems 1387

C. Fabre, M.-C. Boiron, J. Dubessy, A. Chabiron, B. Charoy, and T. M. Crespo: Advances in lithium analysis in solids by means of laser-induced breakdown spectroscopy: An exploratory study 1401

A. Koschinsky, R. Seifert, P. Halbach, M. Bau, S. Brasse, L. M. de Carvalho, and N. M. Fonseca: Geochemistry of diffuse low-temperature hydrothermal fluids in the North Fiji Basin 1409

D. Ayalew, P. Barbey, B. Marty, L. Reisberg, G. Yirgu, and R. Pik: Source, genesis, and timing of giant ignimbrite deposits associated with Ethiopian continental flood basalts 1429

P. Sarda and M. Moreira: Vesiculation and vesicle loss in mid-ocean ridge basalt glasses: He, Ne, Ar elemental fractionation and pressure influence 1449

A. El Goresy, E. Zinner, S. Matsunami, H. Palme, B. Spettel, Y. Lin, and M. Nazarov: Efremovka 101.1: A CAI with ultrarefractory REE patterns and enormous enrichments of Sc, Zr, and Y in Fassaite and Perovskite 1459

Book Reviews

C. Koeberl: *An Introduction to the Theory of Stellar Structure and Evolution* by D. Prialnik 1493

S. R. Taylor: *Earth–Moon Relationships* by C. Barbieri and F. Rampazzi 1495

Errata

Erratum to Crayton J. Yapp (2001), "Mixing of CO_2 in Surficial Environments as Recorded by the Concentration and $\delta^{13}C$ Values of the $Fe(CO_3)OH$ Component in Goethite," *Geochimica et Cosmochimica Acta* Vol. 65, 4115 to 4130. 1497

May (Vol. 66, No. 9)

Volume 66, Number 9 May 2002

Articles

C. Maréchal and F. Albarède: Ion-exchange fractionation of copper and zinc isotopes 1499

J. Jurjovec, C. J. Ptacek, and D. W. Blowes: Acid neutralization mechanisms and metal release in mine tailings: A laboratory column experiment 1511

A. C. Kurtz, L. A. Derry, and O. A. Chadwick: Germanium–silicon fractionation in the weathering environment 1525

A.-C. Pierson-Wickmann, L. Reisberg, and C. France-Lanord: Behavior of Re and Os during low-temperature alteration: Results from Himalayan soils and altered black shales 1539

M.-P. Isaure, A. Laboudigue, A. Manceau, G. Sarret, C. Tiffreau, P. Trocellier, G. Lamble, J.-L. Hazemann, and D. Chateigner: Quantitative Zn speciation in a contaminated dredged sediment by μ-PIXE, μ-SXRF, EXAFS spectroscopy and principal component analysis 1549

M. C. Reheis, J. R. Budahn, and P. J. Lamothe: Geochemical evidence for diversity of dust sources in the southwestern United States 1569

I. T. Burke and A. E. S. Kemp: Microfabric analysis of Mn-carbonate laminae deposition and Mn-sulfide formation in the Gotland Deep, Baltic Sea 1589

M. Gehlen, L. Beck, G. Calas, A.-M. Flank, A. J. Van Bennekom, and J. E. E. Van Beusekom: Unraveling the atomic structure of biogenic silica: Evidence of the structural association of Al and Si in diatom frustules 1601

S. M. Archibald, A. A. Migdisov, and A. E. Williams-Jones: An experimental study of the stability of copper chloride complexes in water vapor at elevated temperatures and pressures 1611

J. V. Walther: Experimental determination and analysis of the solubility of corundum in 0.1-molal $CaCl_2$ solutions between 400 and 600°C at 0.6 to 2.0 kbar 1621

P. L. King and J. R. Holloway: CO_2 solubility and speciation in intermediate (andesitic) melts: The role of H_2O and composition 1627

D. J. Cherniak: Ba diffusion in feldspar 1641

I. H. Campbell: Implications of Nb/U, Th/U and Sm/Nd in plume magmas for the relationship between continental and oceanic crust formation and the development of the depleted mantle 1651

M. E. Varela, G. Kurat, P. Hoppe, and F. Brandstätter: Chemistry of glass inclusions in olivines of the CR chondrites Renazzo, Acfer 182, and El Djouf 001 1663

May (Vol. 66, No. 10)

Volume 66, Number 10 May 2002

Articles

J. C. McIntosh, L. M. Walter, and A. M. Martini: Pleistocene recharge to midcontinent basins: Effects on salinity structure and microbial gas generation 1681

K. W. Keatings, T. H. E. Heaton, and J. A. Holmes: Carbon and oxygen isotope fractionation in non-marine ostracods: Results from a 'natural culture' environment 1701

A. A. Migdisov, A. E. Williams-Jones, L. Z. Lakshtanov, and Yu V. Alekhin: Estimates of the second dissociation constant of H_2S from the surface sulfidation of crystalline sulfur 1713

R. Owen, H. Kennedy, and C. Richardson: Isotopic partitioning between scallop shell calcite and seawater: Effect of shell growth rate 1727

E. R. Giambalvo, C. I. Steefel, A. T. Fisher, N. D. Rosenberg, and C. Geoffrey Wheat: Effect of fluid-sediment reaction on hydrothermal fluxes of major elements, eastern flank of the Juan de Fuca Ridge 1739

Y. Zheng, R. F. Anderson, A. van Geen, and M. Q. Fleisher: Remobilization of authigenic uranium in marine sediments by bioturbation 1759

J. K. W. Toporski, A. Steele, F. Westall, R. Avci, D. M. Martill, and D. S. McKay: Morphologic and spectral investigation of exceptionally well-preserved bacterial biofilms from the Oligocene Enspel formation, Germany 1773

P. Alexandrov, G. Ruffet, and A. Cheilletz: Muscovite recrystallization and saddle-shaped $^{40}Ar/^{39}Ar$ age spectra: Example from the Blond granite (Massif Central, France) 1793

Y. Morizet, R. A. Brooker, and S. C. Kohn: CO_2 in haplo-phonolite melt: Solubility, speciation and carbonate complexation 1809

A. Heumann, G. R. Davies, and T. Elliott: Crystallization history of rhyolites at Long Valley, California, inferred from combined U-series and Rb-Sr isotope systematics 1821

J. Majzlan, A. Navrotsky, and J. M. Neil: Energetics of anhydrite, barite, celestine, and anglesite: A high-temperature and differential scanning calorimetry study 1839

G. D. Cody, C. M. O'D. Alexander, and F. Tera: Solid-state (^1H and ^{13}C) nuclear magnetic resonance spectroscopy of insoluble organic residue in the Murchison meteorite: A self-consistent quantitative analysis 1851

D. Xirouchakis, D. S. Draper, C. S. Schwandt, and A. Lanzirotti: Crystallization conditions of Los Angeles, a basaltic Martian meteorite 1867

June (Vol. 66, No. 11)

Volume 66, Number 11 June 2002

Articles

M. F. MILLER: Isotopic fractionation and the quantification of ^{17}O anomalies in the oxygen three-isotope system: An appraisal and geochemical significance 1881

E. A. WEBB and F. J. LONGSTAFFE: Climatic influences on the oxygen isotopic composition of biogenic silica in prairie grass 1891

R. R. CAVE, C. R. GERMAN, J. THOMSON, and R. W. NESBITT: Fluxes to sediments underlying the Rainbow hydrothermal plume at 36°14′N on the Mid-Atlantic Ridge 1905

J. A. RESING and F. J. SANSONE: The chemistry of lava–seawater interactions II: The elemental signature 1925

M. A. SAITO and J. W. MOFFETT: Temporal and spatial variability of cobalt in the Atlantic Ocean 1943

A. G. GROTTOLI: Effect of light and brine shrimp on skeletal $\delta^{13}C$ in the Hawaiian coral *Porites compressa*: A tank experiment 1955

J. RINNA, B. WARNING, P. A. MEYERS, H.-J. BRUMSACK, and J. RULLKÖTTER: Combined organic and inorganic geochemical reconstruction of paleodepositional conditions of a Pliocene sapropel from the eastern Mediterranean Sea 1969

G. A. GOODFRIEND, and G. LAIN ELLIS: Stable carbon and oxygen isotopic variations in modern *Rabdotus* land snail shells in the southern Great Plains, USA, and their relation to environment 1987

M.-Y. SUN, R. C. ALLER, C. LEE, and S. G. WAKEHAM: Effects of oxygen and redox oscillation on degradation of cell-associated lipids in surficial marine sediments 2003

B. TAGIROV, J. SCHOTT, J.-C. HARRICHOURRY, and S. SALVI: Experimental study of aluminum speciation in fluoride-rich supercritical fluids 2013

C. D. K. HERD, L. E. BORG, J. H. JONES, and J. J. PAPIKE: Oxygen fugacity and geochemical variations in the martian basalts: Implications for martian basalt petrogenesis and the oxidation state of the upper mantle of Mars 2025

L. E. BORG, L. E. NYQUIST, H. WIESMANN, and Y. REESE: Constraints on the petrogenesis of Martian meteorites from the Rb-Sr and Sm-Nd isotopic systematics of the Iherzolitic shergottites ALH77005 and LEW88516 2037

Errata

Erratum to David J. Wesolowski (1992) "Aluminum speciation and equilibria in aqueous solution: I. The solubility of gibbsite in the system Na-K-Cl-OH-$Al(OH)_4$ from 0 to 100°C" 2055

June (Vol. 66, No. 12)

Volume 66, Number 12 June 2002

Introduction

B. MYSEN: A tribute to Hatten S. Yoder, Jr. on his 80th birthday 2071

Articles

D. C. PRESNALL, G. H. GUDFINNSSON, and M. J. WALTER: Generation of mid-ocean ridge basalts at pressures from 1 to 7 GPa 2073

R. W. LUTH: Possible implications of modal mineralogy for melting in mantle lherzolites 2091

K. HIROSE and Y. FEI: Subsolidus and melting phase relations of basaltic composition in the uppermost lower mantle 2099

M. WALTER, T. KATSURA, A. KUBO, T. SHINMEI, O. NISHIKAWA, E. ITO, C. LESHER, and K. FUNAKOSHI: Spinel–garnet lherzolite transition in the system CaO-MgO-Al_2O_3-SiO_2 revisited: An in situ X-ray study 2109

E. B. WATSON and J. D. PRICE: Kinetics of the reaction $MgO + Al_2O_3 \rightarrow MgAl_2O_4$ and Al-Mg interdiffusion in spinel at 1200 to 2000°C and 1.0 to 4.0 GPa 2123

P. ULMER and R. J. SWEENEY: Generation and differentiation of group II kimberlites: Constraints from a high-pressure experimental study to 10 GPa 2139

M. J. O'HARA and C. HERZBERG: Interpretation of trace element and isotope features of basalts: Relevance of field relations, petrology, major element data, phase equilibria, and magma chamber modeling in basalt petrogenesis 2167

S. A. MORSE: No mushy zones in the Earth's core 2155

M. PICHAVANT, B. O. MYSEN, and R. MACDONALD: Source and H_2O content of high-MgO magmas in island arc settings: An experimental study of a primitive calc-alkaline basalt from St. Vincent, Lesser Antilles arc 2193

B. D. MARSH: On bimodal differentiation by solidification front instability in basaltic magmas, part 1: Basic mechanics 2211

J. GOTTSMANN and D. B. DINGWELL: Thermal expansivities of supercooled haplobasaltic liquids 2231

J. M. EVENSEN and D. LONDON: Experimental silicate mineral/melt partition coefficients for beryllium and the crustal Be cycle from migmatite to pegmatite 2239

I. KUSHIRO and B. O. MYSEN: A possible effect of melt structure on the Mg-Fe^{2+} partitioning between olivine and melt 2267

K. MIBE, T. FUJII, AND A. YASUDA: Composition of aqueous fluid coexisting with mantle minerals at high pressure and its bearing on the differentiation of the Earth's mantle 2273

B. O. MYSEN and L. ARMSTRONG: Solubility behavior of alkali aluminosilicate components in aqueous fluids and silicate melts at high pressure and temperature 2287

D. RUMBLE, D. GIORGIS, T. IRELAND, Z. ZHANG, H. XU, T. F. YUI, J. YANG, Z. XU, and J. G. LIOU: Low $\delta^{18}O$ zircons, U-Pb dating, and the age of the Qinglongshan oxygen and hydrogen isotope anomaly near Donghai in Jiangsu Province, China 2299

July (Vol. 66, No. 13)

Volume 66, Number 13 July 2002

Articles

D. WEISS, W. SHOTYK, J. RIELEY, S. PAGE, M. GLOOR, S. REESE, and A. MARTINEZ-CORTIZAS: The geochemistry of major and selected trace elements in a forested peat bog, Kalimantan, SE Asia, and its implications for past atmospheric dust deposition 2307

M. H. BRADBURY and B. BAEYENS: Sorption of Eu on Na- and Ca-montmorillonites: Experimental investigations and modelling with cation exchange and surface complexation 2325

R. DÄHN, A. M. SCHEIDEGGER, A. MANCEAU, M. L. SCHLEGEL, B. BAEYENS, M. H. BRADBURY, and M. MORALES: Neoformation of Ni phyllosilicate upon Ni uptake on montmorillonite: A kinetics study by powder and polarized extended X-ray absorption fine structure spectroscopy 2335

F. J. MILLERO, F. HUANG, and A. L. LAFERIERE: The solubility of oxygen in the major sea salts and their mixtures at 25°C 2349

G. S. POKROVSKI, S. KARA, and J. ROUX: Stability and solubility of arsenopyrite, FeAsS, in crustal fluids 2361

K. N. SIRCOMBE and R. A. STERN: An investigation of artificial biasing in detrital zircon U-Pb geochronology due to magnetic separation in sample preparation 2379

Y. AMELIN and A. N. ZAITSEV: Precise geochronology of phoscorites and carbonatites: The critical role of U-series disequilibrium in age interpretations 2399

B. O. MYSEN: Solubility behavior of alkaline earth and alkali aluminosilicate components in aqueous fluids in the Earth's upper mantle 2421

X. XIE, M. E. MINITTI, M. CHEN, H.-K. MAO, D. WANG, J. SHU, and Y. FEI: Natural high-pressure polymorph of merrillite in the shock veins of the Suizhou meteorite 2439

J. T. WASSON and G. W. KALLEMEYN: The IAB iron-meteorite complex: A group, five subgroups, numerous grouplets, closely related, mainly formed by crystal segregation in rapidly cooling melts 2445

July (Vol. 66, No. 14)

Volume 66, Number 14 July 2002

Articles

T. RAHN, N. KITCHEN, and J. EILER: D/H ratios of atmospheric H_2 in urban air: Results using new methods for analysis of nano-molar H_2 samples 2475

C. J. BALLENTINE and B. S. LOLLAR: Regional groundwater focusing of nitrogen and noble gases into the Hugoton-Panhandle giant gas field, USA 2483

G. M. MARION: A molal-based model for strong acid chemistry at low temperatures (<200 to 298 K) 2499

S. EMMANUEL and Y. EREL: Implications from concentrations and isotopic data for Pb partitioning processes in soils 2517

F. J. M. PRIETO and F. J. MILLERO: The values of $pK_1 + pK_2$ for the dissociation of carbonic acid in seawater 2529

K. WRIGHT, R. T. CYGAN, and B. SLATER: Impurities and nonstoichiometry in the bulk and on the $(10\bar{1}4)$ surface of dolomite 2541

B. DEFLANDRE, A. MUCCI, J.-P. GAGNÉ, C. GUIGNARD, and B. SUNDBY: Early diagenetic processes in coastal marine sediments disturbed by a catastrophic sedimentation event 2547

S. DIXIT and P. V. CAPPELLEN: Surface chemistry and reactivity of biogenic silica 2559

N. FAGEL, C. INNOCENT, C. GARIEPY, and C. HILLAIRE-MARCEL: Sources of Labrador Sea sediments since the last glacial maximum inferred from Nd-Pb isotopes 2569

L. TROTIGNON, V. MICHAUD, J.-E. LARTIGUE, J.-P. AMBROSI, L. EISENLOHR, L. GRIFFAULT, M. DE COMBARIEU, and S. DAUMAS: Laboratory simulation of an oxidizing perturbation in a deep granite environment 2583

I. V. VEKSLER, A. M. DORFMAN, D. B. DINGWELL, and N. ZOTOV: Element partitioning between immiscible borosilicate liquids: A high-temperature centrifuge study 2603

V. C. BENNETT, A. P. NUTMAN, and T. M. ESAT: Constraints on mantle evolution from $^{187}Os/^{188}Os$ isotopic compositions of Archean ultramafic rocks from southern West Greenland (3.8 Ga) and Western Australia (3.46 Ga) 2615

Comments and Response

G. DREIBUS and H. WÄNKE: Comment on: "Comparative geochemistry of basalts from the Moon, Earth, HED asteroid, and Mars: Implications for the origin of the Moon," by A. Ruzicka, G. A. Snyder, and L. A. Taylor (2001) *Geochim. Cosmochim. Acta*, 65, 979–997 2631

A. RUZICKA, G. A. SNYDER, and L. A. TAYLOR: Response to the comment by G. Dreibus and H. Wänke on "Comparative geochemistry of basalts from the Moon, Earth, HED asteroid, and Mars: Implications for the origin of the Moon" (2001) *Geochim. Cosmochim. Acta* 65, 979–997 2633

Errata

J. S. RODEN: Errata to John S. Roden, Guanghui Lin, and James R. Ehleringer (2002) Response to the comment of V. J. Terwilliger on "A mechanistic model for interpretation of hydrogen and oxygen isotope ratios in tree-ring cellulose", *Geochim. Cosmochim. Acta* **64,** 21–35; *Geochim. Cosmochim. Acta* **66,** 733–734 2637

August (Vol. 66, No. 15)

Volume 66, Number 15 August 2002

Articles

A. MANCEAU, B. LANSON and V. A. DRITS: Structure of heavy metal sorbed birnessite. Part III: Results from powder and polarized extended X-ray absorption fine structure spectroscopy 2639

T. YOKOYAMA and J. F. BANFIELD: Direct determinations of the rates of rhyolite dissolution and clay formation over 52,000 years and comparison with laboratory measurements 2665

S. T. BRENNAN and T. K. LOWENSTEIN: The major-ion composition of Silurian seawater 2683

M. GALLINARI, O. RAGUENEAU, L. CORRIN, D. J. DEMASTER and P. TRÉGUER: The importance of water column processes on the dissolution properties of biogenic silica in deep-sea sediments I. Solubility 2701

M. J. L. Hoefs, W. I. C. Rijpstra and J. S. Sinninghe Damsté: The influence of oxic degradation on the sedimentary biomarker record I: Evidence from Madeira Abyssal Plain turbidites 2719

J. S. Sinninghe Damsté, W. I. C. Rijpstra and G.-J. Reichart: The influence of oxic degradation on the sedimentary biomarker record II. Evidence from Arabian Sea sediments 2737

R. F. Dias, K. H. Freeman, M. D. Lewan and S. G. Franks: $\delta^{13}C$ of low-molecular-weight organic acids generated by the hydrous pyrolysis of oil-prone source rocks 2755

M. A. Elburg, M. van Bergen, J. Hoogewerff, J. Foden, P. Vroon, I. Zulkarnain and A. Nasution: Geochemical trends across an arc-continent collision zone: magma sources and slab-wedge transfer processes below the Pantar Strait volcanoes, Indonesia 2771

E. M. Ripley, J. G. Brophy and C. Li: Copper solubility in a basaltic melt and sulfide liquid/silicate melt partition coefficients of Cu and Fe 2791

V. Barrón and J. Torrent: Evidence for a simple pathway to maghemite in Earth and Mars soils 2801

August (Vol. 66, No. 16)

Volume 66, Number 16 August 2002

Articles

B. M. Kennedy, T. Torgersen and M. C. van Soest: Multiple atmospheric noble gas components in hydrocarbon reservoirs: A Study of the Northwest Shelf, Delaware Basin, SE New Mexico 2807

E. E. Roden, M. R. Leonardo and F. G. Ferris: Immobilization of strontium during iron biomineralization coupled to dissimilatory hydrous ferric oxide reduction 2823

D. Baron and C. D. Palmer: Solid-Solution Aqueous-Solution Reactions between Jarosite ($KFe_3(SO_4)_2(OH)_6$) and its Chromate Analog 2841

T. Wagner, A. J. Boyce and A. E. Fallick: Laser combustion analysis of $\delta^{34}S$ of sulfosalt minerals: Determination of the fractionation systematics and some crystal-chemical considerations 2855

Z. D. Sharp, T. Durakiewicz, Z. M. Migaszewski and V. N. Atudorei: Antiphase hydrogen and oxygen isotope periodicity in chert nodules 2865

E. J. Elzinga, R. J. Reeder, S. H. Withers, R. E. Peale, R. A. Mason, K. M. Beck and W. P. Hess: EXAFS study of rare-earth element coordination in calcite 2875

J. B. Thomas, R. J. Bodnar, N. Shimizu and A. K. Sinha: Determination of zircon/melt trace element partition coefficients from SIMS analysis of melt inclusions in zircon 2887

H.-P. Liermann and J. Ganguly: Diffusion kinetics of Fe^{2+} and Mg in aluminous spinel: Experimental determination and applications 2903

B. Mysen: Water in peralkaline aluminosilicate melts to 2 GPa and 1400°C 2915

R. L. Palma, R. H. Becker, R. O. Pepin and D. J. Schlutter: Irradiation records in regolith materials, II: Solar wind and solar energetic particle components in helium, neon, and argon extracted from single lunar mineral grains and from the Kapoeta howardite by stepwise pulse heating 2929

G. Kurat, E. Zinner and F. Brandstätter: A plagioclase–olivine–spinel–magnetite inclusion from Maralinga (CK): Evidence for sequential condensation and solid–gas exchange 2959

September (Vol. 66, No. 17)

Volume 66, Number 17 September 2002

Articles

J.-H. Ryu, S. Gao, R. A. Dahlgren and R. A. Zierenberg: Arsenic distribution, speciation and solubility in shallow groundwater of Owens Dry Lake, California 2981

J. L. Skulan, B. L. Beard and C. M. Johnson: Kinetic and equilibrium Fe isotope fractionation between aqueous Fe(III) and hematite 2995

D. B. KENT, J. A. DAVIS, L. C. D. ANDERSON, B. A. REA and J. A. COSTON: Effect of adsorbed metal ions on the transport of Zn- and Ni-EDTA complexes in a sand and gravel aquifer 3017

M. L. SCHLEGEL, K. L. NAGY, P. FENTER and N. C. STURCHIO: Structures of quartz ($10\bar{1}0$)- and ($10\bar{1}1$)-water interfaces determined by X-ray reflectivity and atomic force microscopy of natural growth surfaces 3037

A. A. JESCHKE and W. DREYBRODT: Dissolution rates of minerals and their relation to surface morphology 3055

A. K. GEE and K. W. BRULAND: Tracing Ni, Cu, and Zn kinetics and equilibrium partitioning between dissolved and particulate phases in South San Francisco Bay, California, using stable isotopes and high-resolution inductively coupled plasma mass spectrometry 3063

Y. ZHENG, R. F. ANDERSON, A. VAN GEEN and M. Q. FLEISHER: Preservation of particulate non-lithogenic uranium in marine sediments 3085

N. J. TABOR, I. P. MONTANEZ and R. J. SOUTHARD: Paleoenvironmental reconstruction from chemical and isotopic compositions of Permo-Pennsylvanian pedogenic minerals 3093

S. KLEMME, J. D. BLUNDY and B. J. WOOD: Experimental constraints on major and trace element partitioning during partial melting of eclogite 3109

G. F. DAVIES: Stirring geochemistry in mantle convection models with stiff plates and slabs 3125

M. CHEN, X. XIE, D. WANG and S. WANG: Metal-troilite-magnetite assemblage in shock veins of Sixiangkou meteorite 3143

R. SCHOENBERG, B. S. KAMBER, K. D. COLLERSON and O. EUGSTER: New W-isotope evidence for rapid terrestrial accretion and very early core formation 3151

M. N. MAUTNER and S. SINAJ: Water-extractable and exchangeable phosphate in Martian and carbonaceous chondrite meteorites and in planetary soil analogs 3161

Book Reviews

W. U. REIMOLD: *The Archaeology of Geological Catastrophes*, edited by W. J. McGuire, D. R. Griffiths, P. L. Hancock and I. S. Stewart 3175

September (Vol. 66, No. 18)

Volume 66, Number 18 September 2002

Articles

J. M. ASTILLEROS, C. M. PINA, L. FERNÁNDEZ-DÍAZ andA. PUTNIS: Molecular-scale surface processes during the growth of calcite in the presence of manganese 3177

O. ROUXEL, J. LUDDEN, J. CARIGNAN, L. MARIN and Y. FOUQUET: Natural variations of Se isotopic composition determined by hydride generation multiple collector inductively coupled plasma mass spectrometry 3191

S. R. HIGGINS, G. JORDAN and C. M. EGGLESTON: Dissolution kinetics of magnesite in acidic aqueous solution: A hydrothermal atomic force microscopy study assessing step kinetics and dissolution flux 3201

E. TIPPING, C. REY-CASTRO, STEPHEN E. BRYAN and J. HAMILTON-TAYLOR: Al(III) and Fe(III) binding by humic substances in freshwaters, and implications for trace metal speciation 3211

B. H. PASSEY and T. E. CERLING: Tooth enamel mineralization in ungulates: Implications for recovering a primary isotopic time-series 3225

D. E. GIAMMAR and J. G. HERING: Equilibrium and kinetic aspects of soddyite dissolution and secondary phase precipitation in aqueous suspension 3235

J. K. FREDRICKSON, J. M. ZACHARA, D. W. KENNEDY, C. LIU, M. C. DUFF, D. B. HUNTER and A. DOHNALKOVA: Influence of Mn oxides on the reduction of uranium(VI) by the metal-reducing bacterium *Shewanella putrefaciens* 3247

J. F. MARSHALL and M. T. MCCULLOCH: An assessment of the Sr/Ca ratio in shallow water hermatypic corals as a proxy for sea surface temperature 3263

M. F. LENGKE and R. N. TEMPEL: Reaction rates of natural orpiment oxidation at 25 to 40°C and pH 6.8 to 8.2 and comparison with amorphous As_2S_3 oxidation 3281

R. L. LINNEN and H. KEPPLER: Melt composition control of Zr/Hf fractionation in magmatic processes 3293

J. F. LUHR and M. A. V. LOGAN: Sulfur isotope systematics of the 1982 El Chichón trachyandesite: An ion microprobe study 3303

R. J. WALKER and E. NISBET: ^{187}Os isotopic constraints on Archean mantle dynamics 3317

A. E. RUBIN: Post-shock annealing of Miller Range 99301 (LL6): Implications for impact heating of ordinary chondrites 3327

October (Vol. 66, No. 19)

Volume 66, Number 19 October 2002

Articles

D. AUBERT, P. STILLE, A. PROBST, F. GAUTHIER-LAFAYE, L. POURCELOT, and M. DEL NERO: Characterization and migration of atmospheric REE in soils and surface waters 3339

J. ALÉON, M. CHAUSSIDON, B. MARTY, L. SCHÜTZ, and R. JAENICKE: Oxygen isotopes in single micrometer-sized quartz grains: Tracing the source of Saharan dust over long-distance atmospheric transport 3351

M. J. HENDRY, L. I. WASSENAAR, and T. K. BIRKHAM: Microbial respiration and diffusive transport of O_2, $^{16}O_2$, and $^{18}O^{16}O$ in unsaturated soils: A mesocosm experiment 3367

C. H. LEAR, Y. ROSENTHAL, and N. SLOWEY: Benthic foraminiferal Mg/Ca-paleothermometry: A revised core-top calibration 3375

J. LÜTZENKIRCHEN, J.-F. BOILY, L. LÖVGREN, and S. SJÖBERG: Limitations of the potentiometric titration technique in determining the proton active site density of goethite surfaces 3389

T. K. DALAI, S. KRISHNASWAMI, and M. M. SARIN: Major ion chemistry in the headwaters of the Yamuna river system: Chemical weathering, its temperature dependence and CO_2 consumption in the Himalaya 3397

A. D. JACOBSON, J. D. BLUM, and L. M. WALTER: Reconciling the elemental and Sr isotope composition of Himalayan weathering fluxes: Insights from the carbonate geochemistry of stream waters 3417

Z. ZHANG and Z. DUAN: Phase equilibria of the system methane–ethane from temperature scaling Gibbs Ensemble Monte Carlo simulation 3431

R. A. CREASER, P. SANNIGRAHI, T. CHACKO, and D. SELBY: Further evaluation of the Re-Os geochronometer in organic-rich sedimentary rocks: A test of hydrocarbon maturation effects in the Exshaw Formation, Western Canada Sedimentary Basin .. 3441

G. S. POKROVSKI, I. V. ZAKIROV, J. ROUX, D. TESTEMALE, J.-L. HAZEMANN, A. Y. BYCHKOV, and G. V. GOLIKOVA: Experimental study of arsenic speciation in vapor phase to 500°C: Implications for As transport and fractionation in low-density crustal fluids and volcanic gases 3453

K. W. W. SIMS, S. J. GOLDSTEIN, J. BLICHERT-TOFT, M. R. PERFIT, P. KELEMEN, D. J. FORNARI, P. MICHAEL, M. T. MURRELL, S. R. HART, D. J. DEPAOLO, G. LAYNE, L. BALL, M. JULL, and J. BENDER: Chemical and isotopic constraints on the generation and transport of magma beneath the East Pacific Rise 3481

J. A. Barrat, A. Jambon, M. Bohn, Ph. Gillet, V. Sautter, C. Göpel, M. Lesourd, and F. Keller: Petrology and chemistry of the Picritic Shergottite North West Africa 1068 (NWA 1068) 3505

Errata

D. J. Wesolowski: Errata to David J. Wesolowski (1992) Aluminum speciation and equilibria in aqueous solution: I. The solubility of gibbsite in the system Na-K-Cl-OH-Al$(OH)_4$ from 0 to 100°C, *Geochim. Cosmochim. Acta* **56,** 1065–1091 3519

October (Vol. 66, No. 20)

Volume 66, Number 20 October 2002

Articles

P. M. Outridge, M. H. Hermanson, and W. L. Lockhart: Regional variations in atmospheric deposition and sources of anthropogenic lead in lake sediments across the Canadian Arctic 3521

M. C. Duff, J. U. Coughlin, and D. B. Hunter: Uranium co-precipitation with iron oxide minerals 3533

Ma. C. Alfaro-De la Torre and A. Tessier: Cadmium deposition and mobility in the sediments of an acidic oligotrophic lake 3549

J. P. Cowen, X. Wen, and B. N. Popp: Methane in aging hydrothermal plumes 3563

M. F. Lehmann, S. M. Bernasconi, A. Barbieri, and J. A. McKenzie: Preservation of organic matter and alteration of its carbon and nitrogen isotope composition during simulated and in situ early sedimentary diagenesis 3573

S. Weldeab, K.-C. Emeis, C. Hemleben, T. W. Vennemann, and H. Schulz: Sr and Nd isotope composition of Late Pleistocene sapropels and nonsapropelic sediments from the Eastern Mediterranean Sea: Implications for detrital influx and climatic conditions in the source areas 3585

A. V. Zotov, B. R. Tagirov, I. I. Diakonov, and K. V. Ragnarsdottir: A potentiometric study of Eu^{3+} complexation with acetate ligand from 25 to 170°C at P_{sat} 3599

W. Liu, J. Brugger, D. C. McPhail, and L. Spiccia: A spectrophotometric study of aqueous copper(I)–chloride complexes in LiCl solutions between 100 °C and 250 °C 3615

J. Baker, T. Waight, and D. Ulfbeck: Rapid and highly reproducible analysis of rare earth elements by multiple collector inductively coupled plasma mass spectrometry 3635

B. J. Wood and J. D. Blundy: The effect of H_2O on crystal-melt partitioning of trace elements 3647

A. E. Rubin, G. W. Kallemeyn, and J. T. Wasson: A IAB-complex iron meteorite containing low-Ca clinopyroxene: Northwest Africa 468 and its relationship to lodranites and formation by impact melting 3657

Errata

Y. Nozaki: Erratum to Nozaki, Lerche, Alibo and Tsutsumi (2000), Dissolved indium and rare earth elements in three Japanese rivers and Tokyo Bay: Evidence for anthropogenic Gd and In, *Geochimica et Cosmochimica Acta* **64,** 3975–3982. 3673

C. Maréchal: Erratum to Chloé Maréchal and Francis Albarède (2002), Ion-exchange fractionation of copper and zinc isotopes, *Geochimica et Cosmochimica Acta* **66,** 1499–1509. 3675

November (Vol. 66, No. 21)

Volume 66, Number 21 November 2002

Introduction

P. A. Candela: A Special Issue Dedicated to Professor Heinrich D. Holland 3677

Articles

T. P. Vorlicek and G. R. Helz: Catalysis by mineral surfaces: Implications for Mo geochemistry in anoxic environments 3679

C. G. Wheat, M. J. Mottl, and M. Rudnicki: Trace element and REE composition of a low-temperature ridge-flank hydrothermal spring 3693

W. YANG, H. D. HOLLAND, and R. RYE: Evidence for low or no oxygen in the late Archean atmosphere from the ~2.76 Ga Mt. Roe #2 paleosol, Western Australia: Part 3 3707

M. R. FRANK, P. A. CANDELA, P. M. PICCOLI, and M. D. GLASCOCK: Gold solubility, speciation, and partitioning as a function of HCl in the brine-silicate melt-metallic gold system at 800°C and 100 MPa 3719

J. HORITA, H. ZIMMERMANN, and H. D. HOLLAND: Chemical evolution of seawater during the Phanerozoic: Implications from the record of marine evaporites 3733

D. J. BEERLING, J. A. LAKE, R. A. BERNER, L. J. HICKEY, D. W. TAYLOR, and D. L. ROYER: Carbon isotope evidence implying high O_2/CO_2 ratios in the Permo-Carboniferous atmosphere 3757

J. HORITA, D. R. COLE, V. B. POLYAKOV, and T. DRIESNER: Experimental and theoretical study of pressure effects on hydrogen isotope fractionation in the system brucite-water at elevated temperatures 3769

G. A. WILLIAMS and K. K. TUREKIAN: Atmospheric supply of osmium to the oceans 3789

J. H. CHEN, D. A. PAPANASTASSIOU, and G. J. WASSERBURG: Re-Os and Pd-Ag systematics in Group IIIAB irons and in pallasites 3793

H. D. HOLLAND: Volcanic gases, black smokers, and the Great Oxidation Event 3811

G. T. SNYDER and U. FEHN: Origin of iodine in volcanic fluids: ^{129}I results from the Central American Volcanic Arc 3827

F. PAWELLEK, F. FRAUENSTEIN, and J. VEIZER: Hydrochemistry and isotope geochemistry of the upper Danube River 3839

November (Vol. 66, No. 22)

Volume 66, Number 22 November 2002

S. D. KELLY, K. M. KEMNER, J. B. FEIN, D. A. FOWLE, M. I. BOYANOV, B. A. BUNKER, and N. YEE: X-ray absorption fine structure determination of pH-dependent U-bacterial cell wall interactions 3855

J. QIAN, U. SKYLLBERG, W. FRECH, W. F. BLEAM, P. R. BLOOM, and P. E. PETIT: Bonding of methyl mercury to reduced sulfur groups in soil and stream organic matter as determined by X-ray absorption spectroscopy and binding affinity studies 3873

V. J. TERWILLIGER, J. L. BETANCOURT, S. W. LEAVITT, and P. K. VAN DE WATER: Leaf cellulose δD and $\delta^{18}O$ trends with elevation differ in direction among co-occurring, semiarid plant species 3887

K. TUNCAY, J. PUCKETT, Z. AL-SHAEIB, and P. ORTOLEVA: Pits, outgrowths, and inclusions as coated grain kinetic instabilities 3901

J. CAMA, V. METZ, and J. GANOR: The effect of pH and temperature on kaolinite dissolution rate under acidic conditions 3913

J. S. GEELHOED, J. C. L. MEEUSSEN, S. HILLIER, D. G. LUMSDON, R. P. THOMAS, J. G. FARMER, and E. PATERSON: Identification and geochemical modeling of processes controlling leaching of Cr(VI) and other major elements from chromite ore processing residue 3927

E. J. ELZINGA and R. J. REEDER: X-ray absorption spectroscopy study of Cu^{2+} and Zn^{2+} adsorption complexes at the calcite surface: Implications for site-specific metal incorporation preferences during calcite crystal growth 3943

A. L. SESSIONS, L. L. JAHNKE, A. SCHIMMELMANN, and J. M. HAYES: Hydrogen isotope fractionation in lipids of the methane-oxidizing bacterium *Methylococcus capsulatus* 3955

W. M. LAMB, C. J. MCSHANE, and R. K. POPP: Phase relations in the CH_4-H_2O-NaCl system at 2 kbar, 300 to 600°C as determined using synthetic fluid inclusions 3971

C.-T. A. LEE: Platinum-group element geochemistry of peridotite xenoliths from the Sierra Nevada and the Basin and Range, California 3987

M. TANIMIZU and T. TANAKA: Coupled Ce–Nd isotope systematics and rare earth elements differentiation of the moon 4007

December 2002 (Vol. 66, No. 23)

Volume 66, Number 23 December 2002

S. Arnórsson, I. Gunnarsson, A. Stefánsson, A. Andrésdóttir, and A. E. Sveinbjörnsdóttir: Major element chemistry of surface- and ground waters in basaltic terrain, N-Iceland. I. Primary mineral saturation 4015

P. S. Nico, C. Anastasio, and R. J. Zasoski: Rapid Photo-oxidation of Mn(II) Mediated by Humic Substances 4047

Y. L. Mikhlin, A. V. Kuklinskiy, N. I. Pavlenko, V. A. Varnek, I. P. Asanov, A. V. Okotrub, G. E. Selyutin, and L. A. Solovyev: Spectroscopic and XRD studies of the air degradation of acid-reacted pyrrhotites 4057

F. Tamburini, S. Huon, P. Steinmann, F. E. Grousset, T. Adatte, and K. B. Föllmi: Dysaerobic conditions during Heinrich events 4 and 5: Evidence from phosphorus distribution in a North Atlantic deep-sea core 4069

R. Y. P. Burhan, J. M. Trendel, P. Adam, P. Wehrung, P. Albrecht, and A. Nissenbaum: Fossil bacterial ecosystem at methane seeps: Origin of organic matter from Be'eri sulfur deposit, Israel 4085

J. Holocher, F. Peeters, W. Aeschbach-Hertig, M. Hofer, M. Brennwald, W. Kinzelbach, and R. Kipfer: Experimental investigations on the formation of excess air in quasi-saturated porous media 4103

R. M. Weaver, M. F. Hochella, Jr., and E. S. Ilton: Dynamic processes occurring at the Cr^{III}_{aq}-manganite (γ-MnOOH) interface: Simultaneous adsorption, microprecipitation, oxidation/reduction, and dissolution 4119

M. Jull, P. B. Kelemen, and K. Sims: Consequences of diffuse and channelled porous melt migration on uranium series disequilibria 4133

Y. Liu, H. Nekvasil, and H. Long: Water dissolution in albite melts: Constraints from *ab initio* NMR calculations 4149

R. C. Newton and C. E. Manning: Solubility of enstatite + forsterite in H_2O at deep crust/upper mantle conditions: 4 to 15 kbar and 700 to 900°C 4165

L. Binet, D. Gourier, S. Derenne, and F. Robert: Heterogeneous distribution of paramagnetic radicals in insoluble organic matter from the Orgueil and Murchison meteorites 4177

R. J. Walker, M. F. Horan, J. W. Morgan, H. Becker, J. N. Grossman, and A. E. Rubin: Comparative ^{187}Re-^{187}Os systematics of chondrites: Implications regarding early solar system processes 4187

December (Vol. 66, No. 24)

Volume 66, Number 24 December 2002

Articles

G. S. Pokrovski, J. Schott, J.-L. Hazemann, F. Farges, and O. S. Pokrovsky: An X-ray absorption fine structure and nuclear magnetic resonance spectroscopy study of gallium–silica complexes in aqueous solution 4203

K. M. Rosso and J. J. Morgan: Outer-sphere electron transfer kinetics of metal ion oxidation by molecular oxygen 4223

M. K. Vollmer, R. F. Weiss, R. T. Williams, K. K. Falkner, X. Qiu, E. A. Ralph, and V. V. Romanovsky: Physical and chemical properties of the waters of saline lakes and their importance for deep-water renewal: Lake Issyk-Kul, Kyrgyzstan 4235

K. Pfeifer, C. Hensen, M. Adler, F. Wenzhöfer, B. Weber, and H. D. Schulz: Modeling of subsurface calcite dissolution, including the respiration and reoxidation processes of marine sediments in the region of equatorial upwelling off Gabon 4247

R. Mallick and N. Frank: A new technique for precise uranium-series dating of travertine micro-samples 4261

A. W. G. Pike, R. E. M. Hedges, and P. Van calsteren: U-series dating of bone using the diffusion-adsorption model 4273

R. B. Thomas, M. M. Hirschmann, H. Cheng, M. K. Reagan, and R. L. Edwards: ($^{231}Pa/^{235}U$)-($^{230}Th/^{238}U$) of young mafic volcanic rocks from Nicaragua and Costa Rica and the influence of flux melting on U-series systematics of arc lavas 4287

A. A. Migdisov and A. E. Williams-Jones: A spectrophotometric study of neodymium(III) complexation in chloride solutions 4311

M. G. Barth, R. L. Rudnick, I. Horn, W. F. McDonough, M. J. Spicuzza, J. W. Valley, and S. E. Haggerty: Geochemistry of xenolithic eclogites from West Africa, part 2: Origins of the high MgO eclogites 4325

G. Giuli, G. Pratesi, C. Cipriani, and E. Paris: Iron local structure in tektites and impact glasses by extended X-ray absorption fine structure and high-resolution X-ray absorption near-edge structure spectroscopy 4347

H. Yurimoto and J. T. Wasson: Extremely rapid cooling of a carbonaceous-chondrite chondrule containing very ^{16}O-rich olivine and a ^{26}Mg-excess 4355

Errata

R. H. Wood: Erratum to Shinichi Sakane, Wenbin Liu, Douglas J. Doren, Everett L. Shock, and Robert H. Wood (2001) Prediction of the Gibbs energies and an improved equation of state for water at extreme conditions from ab initio energies with classical simulations, *Geochimica et Cosmochimica Acta* **65,** 4067–4075 4365

J. M. Adelson, G. R. Helz, and C. V. Miller: Erratum to J. M. Adelson, G. R. Helz, and C. V. Miller (2001) Reconstructing the rise of recent coastal anoxia; molybdenum in Chesapeake Bay sediments. *Geochimica et Cosmochimica Acta* **65,** 237–252 ... 4367

Index I